

A Review on Control and Utilities of Robotic Arm

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Abstract

In this paper talks about how a robotic arm works, in industries and medical line and also the operating methods on which it works modern ways of operating and usable or not. Concepts of human interfacing with robotic arm available ways using sensor cameras, IR sensors etc. Its helps those people who need this as per requirement.in this paper also talks about the problem faced by the Agriculture sector.

Keywords: Robotic Arm; Kinect-sensor; Automation; KUKA; EMG

Introduction

Robotics is used in various field as we know it is used in agriculture sector, Industries, Automobile factories, Space Robotics, underwater Robotics, Search and Rescues And security Robotics. There is various way of using Robotics in those field where it is necessary, Robotics play an important role all over all the fields. Now day by day our interface with robots is very general. We find different way to interface with the robot. Our technology now day we use hands movement and control robots using these hand gestures for the movement of robot it help to operates. Image processing also used for control the movement of robot. Microsoft also developed a Microsoft Xbox 360 Kinect sensor. It is basically detect the Action of human arm in 3D space and by follow the command of human arm robotic arm works. KUKA is a manufacture of robotics arm KUKA robots had an ability work in any atmosphere the work as precision and they had welding robot they weld at high temperature without any fatigue. We also talk about the uses of robotics helping human.

Literature Review

K. Jahnvi and P. Sivraj (2017) in this paper [1] had discussed about the use of robotics in industries and how it works according to the author robotic arm works as the human arm works it copy all the movement and interact with the activity which done by human. All the joint which are in motion send a feedback to microcontroller and controller responds as that the human arm works. According to the author Robotic arm are mechanical joint and they are programmable that we can easily programmed it as we want. Author also talks about the software that use for interfacing with robotic arm microcontroller using MATLAB. MATLAB programmed a robot by using that coordinates like X-axis, Y-axis, and Z-axis.

J. Lee, W. Li, J. Shen and C. Chuang, (2018) in this paper [2] author had discussed about the automation in which robotics used in industries manipulators used in parallel in every machine where we need precision these are convenient for repeating task and doing dangerous task and they works on their 6 axis which can be controlled using Kinematics methods .kinematics used to find out the Robotic arm movement in space, by reading speed, time and Displacement it finds the angle of

each joint. Inverse kinematics help to find out the robot joint angle. Also the rotational angles A1, A2, A3, A4, A5, and A6. Author gave an example of automation in production line of industry glue dispensing in square lamp housing.

R. K. Megalingam, S. Boddupalli and K. G. S. Apuroop, (2017) in this paper [3] author had discussed about the categories of Robot, which are automatic, semiautomatic and manually controlled. They had built in hardware which is further connected to the software on which robot hardware actually works. Robotic arm is a programmable arm which can be programmed as works as per the human arm works. The last joint or terminus of robotic called as End-Effector. These end-effector can do several task such that welding, pick and place, drilling, watering, and other tasks. These Robotic arm are involves in many application such as medical, disaster management, and can be controlled with joy stick, Switches and any other options which need precision. Author also talks about the controlling of robotic arm using potentiometers connected with Arduino and help to connect the robotic arm.

R. Szabó and A. Gontean, (2015) in this paper [4] author had discussed about the blindness of the robots in industries. They are only programmable by which they can move in any position and direction. There are also some other mothered like forward and inverse kinematics. In today's technology is very flexible Robot need to take decision during operations and adjustable during operation and they had auto calibration if there is a fault in calibration. Author discussed about the method of using stereo cameras to visualize a robotic arm in 3D and making robotic arm processing after receiving the feedback from the camera. According to the author future work involves the algorithm in industrial Environment.

A. R. J. Almusawi et.al. (2016) in this paper [5] author had discussed about the VRM simulation of a robot give an ability of behavior and also in dynamic control. Virtual Reality modeling language. The robotic arm capable to pick and place in real time using EMG signals. Author discussed about the OWI-535 Robotic arm which was an articulated manipulator it had some limitation on its axis on rotational side made any other limits.

I. P. Ktistakis and N. G. Bourbakis, (2015) in this paper [6] author had discussed about the Society needs for human interactive robotic wheel chair that help people with disabilities. In all over the world there are many young disabled persons they faces problems day by day like opening doors washing and other tasks. Manufacture decided to make wheelchair with robotic arm which help to eating, drinking, washing, shaving and some other tasks. Author had discussed about some of robotic arm which are used in wheel chairs The Raptor Arm, DORA, The Manus Arm, RIBA, PerMMA, JACO and Dee-light.

M. R. S. B. Souza et.al. (2015) in their paper [7] author had discussed about the design, manufacturing and construction of a wireless robotic arm for that educational purpose. In this paper author had discussed about the scope of robotics and implementation in our life and surroundings. Design of robotic arm is most important for the working properly it is necessary the design is accurate as per our need. In future this robotics help to many operations in medical line industries and working in complicated place where a robot can only work. Author also discussed about low cost robotic arm which made only from the educational purpose. For future it is possible to make command easier to send commands to the robot adding the arm path control based on functions and increase the stability of robots.

R. J. Moreno, (2014) in this paper [8] author had discussed about the Microsoft Kinect sensor which had series of cameras that detect het player position in 3D space and give a best experience to the player the Kinect use the depth sensor to

detect the player body it identify the arms, legs, knees, and 20body joints and make a Digital Skeleton of it. The designed robotic arm had Six degree of freedom, each one controlled by a servo motor. And it is possible to control 2 arm of a robot by following the connected and movement of human hands. It is the easier way to operate a robotic arm.

M. Dahari and J. Tan, (2011) in this paper [9] author had discussed about the forward Kinematics and inverse kinematics and also about the welding Robot working.in Forward kinematics the position and face of end effector of robotic arm it reference coordinate works on the geometry parameters of the link of the robotic arm. Inverse kinematics opposite to the forward kinematics end of the manipulators give the reference of the coordinates system. Author had been discussed about the KUKA KR16 robot used for the welding purpose in this paper it was discussed that how can easy the welding process of the robot in this paper was discussed that welding a square block on a sheet. Basically welding is more easily done by robotic arm.

Ganesh Choudhary B and Chethan Ram B V (2014) in their paper [10] had discussed about the real time robotics in that all old techniques are extirpate like using of buttons, joystick. Now these days Image processing using camera. We can detect the virtual of human arm and follow the instruction robotic arm work as well as the human arm moves.

R. K. Megalingam et.al. (2017) in their paper [11] had discussed about the problem that faces by our Agriculture sector which are shortage in farmland, ownership on lands economic challenges globalization, shortage in Worker etc. and environmental challenges climate changes, food security etc. In INDIA 65% of people dependent on the agriculture sector. If we use new technology for the agriculture we make it easier to farmer and labor works on farmland. Author had discussed about the problems and solution of inverse kinematic using Jacobean method

Conclusion

In this paper, I have presented the need of robotics and robotic arm. Robotic arms play an important role in each and every fields like in medical, Agricultures. Robotic arm copy the full motion of a human arm. So it help also those who facing disabilities problems. So robotic arm is the current technology that works at every field as per the requirement.

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